Chemical contamination of material cycles

Pivnenko, Kostyantyn; Astrup, Thomas Fruergaard

Published in:
Book of Abstracts. DTU's Sustain Conference 2015

Publication date:
2015

Document Version
Publisher's PDF, also known as Version of record

Chemical contamination of material cycles

Kostyantyn Pivnenko*[1], Thomas F. Astrup[1]

1: DTU Environment

*Corresponding author email: kosp@env.dtu.dk

Material recycling represents a backbone of sustainable society in the context of circular economy. Ideally, materials are converted into products, used by the consumers, and discarded, just to be recycled and converted into newly manufactured products. Furthermore, materials may also contain chemicals, which would be re-introduced into the loop once a product is recycled. Such chemicals may not be removed in the recycling process, persist, and contaminate the newly manufactured products. Chemical contamination could potentially put product consumers at unnecessary risk and jeopardize public acceptance of recycled-material-based products.

Paper and plastics are conventional materials used to manufacture a variety of products within main sectors of economy (i.e. packaging, transportation, construction, services, and other). A number of chemicals can be either intentionally or unintentionally added to these materials in the process of product manufacturing or final product conversion. Extend of chemical use, as well as their presence in paper and plastic products remains largely uninvestigated. The aim of this project is to obtain reliable quantitative data on presence of selected (potentially hazardous) chemicals in paper and plastic materials, and furthermore discuss the likely impacts of chemical contamination on material recycling. The work is part of the new Danish initiative focusing on Integrated Resource Management and Recovery (IRMAR, grant no. 11-116775). The outcomes of the work will provide crucial basis for future waste characterization activities, environmental and risk assessments of material recycling, as well as provide authorities, scientific community and society with a necessary basis for evaluating potential future limitations to recycling and address means of mitigating accumulation and spreading of chemicals in various materials.

Figure 1. Integrated Resource Management and Recovery (IRMAR, grant no. 11-116775)